

## **New Modeling Tools for Energy Markets**

**Chung-Li Tseng**

Special Editor

The electricity industry has been undergoing major changes. Recent events such as the collapse of Enron, California power crisis, the Great Blackout in the East Coast, and the FERC's Standard Market Design clearly indicate the challenges and complexity embedded by this industrial restructuring, demanding new modeling tools for energy planning, operation, and management. This special issue is the second of two devoted to the quantitative models for dealing with impacts of these changes on energy market modeling. The four papers in this issue provide a broad range of applications in energy markets. The first special issue addressed systematic issues stemming from these changes.

The first paper, "Modeling a Hydrothermal System with Hydro- and Snow Reservoirs," by Magnus Hindsberger, analyzes the impact of variable precipitation on the prices of the Nordic power market. The second paper, entitled "Investment Model for Power Generation and Transmission Network Expansion in Turkey," by Kiran Gampala, Linet Özdamar, and Shaligram Pokharel, proposes an optimization model for concurrent transmission and generation investment plans.

The third paper in this issue, entitled "Impact of Market Uncertainty on Congestion Revenue Right Valuation," by Haibin Sun, Shi-Jie Deng, and A. P. Sakis Meliopoulos, uses Monte Carlo simulation to value congestion revenue rights including financial transmission rights (FTR) and flowgate rights (FGR). The final paper by Jorge F. Valenzuela, entitled "Analytical Approximation to the Probability Distribution of Electricity Marginal Production Costs" proposes an analytical method to estimate marginal production costs, which could potentially benefit market participants in a deregulated environment.

With the papers covering a variety of topics in the deregulated power markets, it is hoped that they can motivate new research on the array of important problems arising in this fast-changing industry.